

PhD Candidate Profile

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Area (field) of study:

Degradation electrochemical of organic compounds

Thesis Title:

Synthesis of microwave-assisted metal oxide mixed anodes applied in the degradation of organic compounds

Abstract:

The contamination of water by different pollutants is a matter of concern, because this precious good is becoming increasingly scarce, which leads to the treatment of these be a great challenge today. In this context, the development of treatment technologies to adapt the effluent to the disposal rules is of fundamental importance. Among the existing methods of treatment, the electrochemical method has gained prominence for being economical, with easy assembly and operation, besides being environmentally compatible. When analyzing this



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type of treatment must take into account the fundamental tool for the development of these systems - the electrode. There are several types of electrodes, a well studied are metal oxide mixture (MOM) type anodes. The MOMs consist of a mixture of two or more metal oxides deposited on a metallic substrate forming new stable compounds, presenting significant improvement in their properties, as activity and catalytic stability compared to their respective pure components. The physical and electrochemical properties of MOM anodes are dependent on the synthesis methodology. It is widely reported in the literature that MOMs have been produced by the methods of thermal decomposition of chlorides, sol-gel and Pechini method. The heat treatment is commonly performed using an electric furnace as a heating source, since for MOM synthesis, the calcination temperature of the electrodes must be sufficiently high for the formation of the metal oxide film without any detriment to the mechanical and electrical properties of the metal substrate. An alternative method would be the microwave oven, because during the heating of microwave materials, radiation penetrates the material so that the heat transfer occurs from the core of the material to the surface thereof. For this reason, microwave heating emerges as an innovative alternative to the conventional kiln calcination process. In addition, recent studies have shown that the efficiency of electrochemical processes can be enhanced by the combination of two or more POAs, such as the application of ultrasound, due to the increase in the generation of oxidizing species and the better activation of such radicals

Collaborations:

N/A

Publications:

GONZAGA, I. M. D.; ANDRADE, A. C. A. ; SILVA, R. S. ; SALAZAR-BANDA, G. R. ; CAVALCANTI, E. B. ; EGUILUZ, K. I. B. . Synthesis of high-area chemically modified electrodes using microwave heating. Chemical Engineering Communications, 2018.

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Presentations:

VASCONCELOS, V.M.; GONZAGA, I.M.D.; DÓRIA, A.R.; EGUILUZ, K.I.B.; SALAZAR-BANDA, G.R. Application of electrode dsa in the study of sonoelectrochemical degradation of triclosan. 58^o Brazilian Congress of Chemistry 2018

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